

REPLACEMENT SHEET

ABSTRACT OF THE DISCLOSURE

A METHOD OF, SYSTEM FOR, AND COMPUTER PROGRAM PRODUCT FOR PROVIDING EFFICIENT UTILIZATION OF MEMORY HIERARCHY THROUGH CODE RESTRUCTURING

Code restructuring or reordering based on profiling information and memory hierarchy is provided by constructing a *Program Execution Graph* (PEG) corresponding to a level of the memory hierarchy, partitioning this PEG to reduce estimated memory overhead costs below an upper bound, and constructing a PEG for a next level of the memory hierarchy from the partitioned PEG. The PEG is constructed from control flow and frequency information from a profile of the program to be restructured. The PEG is a weighted undirected graph comprising nodes representing basic blocks and edges representing transfer of control between pairs of basic blocks. The weight of a node is the size of the basic block it represents and the weight of an edge is the frequency of transition between the pair of basic blocks it connects.